



Publication office at Bartow, Florida. Entered as second class matter February 16th, 1920, at the post office at Tampa, Florida, under the act of March 3, 1879. Entered as second class matter June 19, 1933, at the post office at Bartow, Florida, under act of March 3, 1879.

## Scale Infestations On Citrus During 1940

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During the year of 1940 the heaviest general infestation of scales developed on citrus that has been experienced in recent years, and the infestation of other insects and mites was also heavy. The reasons for the unusual abundance of insects and mites cannot be definitely stated, but there were several factors that may have been responsible for the unusually heavy infestations throughout most of the citrus belt. Two of the most likely reasons for the general infestation are, first, natural agencies or the upsetting of natural controls due to unusual weather conditions and, second, the generally improved condition of the average grove due to changes in cultural practices. The following discussion will deal mainly with the two reasons for scale increases mentioned above.

### Natural Agencies

It is quite possible that the low temperatures of last January were a factor in upsetting the natural balance of insect control. Insects attacked by diseases or parasites are in a weakened condition, and abnormally low temperatures such as occurred from January 26 to 29 may have killed prematurely a high percentage of insects and at the same time caused a high mortality of parasites that had not completed their life cycle. As Miller (2) pointed out, the low temperatures of last January did not remain at a low level

sufficiently long to cause much mortality. The writer (3) also stated that the mortality of purple scales was no higher than usual except in groves where the trees were thinly foliated or on the outside of the leaves. The theory that low temperatures may have upset the natural agencies of control does not appear to apply to whiteflies, rust mites, six-spotted mites, and purple mites because no abnormal reduction in population was noted following the freeze except by defoliation. See Miller (2) and Thompson (3).

A very probable reason for the heavy infestation of insects and mites was the dry weather during 1940. It is well known that most of the insects and mites that infest citrus in Florida are more abundant in dry than in wet seasons. At the Citrus Experiment Station there was a deficiency of rainfall during each month from February to November, inclusive. The rainfall was very irregular during the summer and fall months with comparatively long periods of dry weather. In May there were only four scattered showers, totaling .71 inch for the entire month. In June the total rainfall was nearly normal but there was one period of nine days with only one light shower. In July there was a period of 13 days with one light shower. During August the rainfall was very irregular; between August 6 and August 27

there were three light showers which totaled .21 inch of rain. Between September 7 and 25 there was .13 inch of rainfall. During October only one shower of .54 inch occurred, and in November .10 inch or a total of .64 inch of rainfall during October and November.

In July purple scales were becoming noticeable on the limbs and twigs of trees that had not been sprayed with oil. Heavy infestations developed during August, September, and October which resulted in a great deal of dead wood and dropped fruit. The wood was especially heavily infested even in groves that lost 50 to 90 per cent of their leaves subsequent to the January freeze.

Due to the condition of many groves following the freeze last winter, a high percentage of them were sprayed with nutritional sprays containing copper, zinc, and manganese. Many growers are of the opinion that the nutritional sprays were responsible for the heavy scale infestations; but, as stated above, the seasonal condition was more of a factor in scale increases than any sprays that were applied, and heavy infestations developed generally in groves over the State where no nutritional sprays were applied. In unsprayed check plots in various experiments the scale increases were more pronounced during 1940 than during any other year

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# Seasonal Changes In Principal Varieties Of Florida Oranges...

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and Diseases, Bureau of Plant  
Industry, U. S. D. A.  
At Meeting of Florida State Horticultural Society

This paper is based on results of an investigation made for the purpose of obtaining information on the seasonal changes, physical and chemical trends and varietal characteristics of the leading and some of the less common commercial varieties of Florida oranges (*Citrus sinensis*, Osbeck) during the development and ripening on the tree.

This study shows how the character of the different varieties of oranges is related to the legal maturity standard at different times prior to and throughout the normal harvesting period for each variety.

The findings are based on a systematic study during three seasons from 1935 to 1938, involving the periodic analysis of more than 13,000 individual fruits and about 1,100 composite samples of 25 to 50 oranges each.

The varieties of oranges included in the investigation were: Parson Brown, grown on rough lemon and sour orange rootstocks, Boone's Early, Sixteen to One, Hamlin, Homosassa, Jaffa and Pineapple oranges,

grown on rough lemon rootstocks: Conner's Seedless and Lue Gim Gong, on sour orange rootstock; Seedlings, and Valencias, grown on rough lemon, sour orange, grapefruit, Cleopatra and sweet orange rootstocks in Central Florida, and Valencia oranges grown on rough lemon and sour orange rootstocks at Merritt Island, Florida East Coast.

The determinations included seasonal changes in weight and diameter of the fruit, color of rind and flesh, thickness of rind, volume of juice, flavor, ascorbic acid content, buffer capacity, ash, pH, total acidity, total solids, sucrose and reducing sugars in the juice of early, mid-season and late oranges.

In the present paper only a few of the results for the principal varieties and for a typical season are presented. The complete report for all the varieties of oranges tested will be published as a technical bulletin of the United States Department of Agriculture.

The oranges were obtained from 9 different commercial groves in Cen-

tral Florida and on Merritt Island, Florida East Coast. In these groves, plots of about 25 trees were selected. Care was exercised in the choice of both groves and plots in order to avoid abnormal soil and fertilizer practices. Exceptionally young and exceptionally old trees were avoided unless the fruit from such trees was wanted for comparative purposes.

Samples were usually collected at intervals of two weeks until commercial picking of the plots. After this, only 2 or 3 trees were reserved to supply fruit for later analyses, which were made at somewhat longer intervals.

Each variety was sampled over a period of several months so that various stages of fruit development and ripening were included. The analyses were commenced while fruit was still immature and were continued periodically, usually until senescence was reached, as indicated by the flavor of the juice and the "drying out" of the fruit. Tests on early and midseason varieties commenced each season about September 1,

Table 1. Seasonal Changes in the Volume of Juice of Early and Midseason Oranges.

Variety	Rootstocks	Juice/100 gms. fruit				Juice/80 lbs. fruit				Juice/90 lbs. Fruit				Juice Standard Box (1 3-5 bu.)	
		9/1-10/13	10/14-11/24	11/25-1/5	1/6-2/16	9/1-10/13	10/14-11/24	11/25-1/5	1/6-2/16	9/1-10/13	10/14-11/24	11/25-1/5	1/6-2/16	Size 200	Size 150
			MI				Gals.				Gals.			Gals.	
Parson Brown	R. L.	50	53	48	48	4.8	5.1	4.6	4.6	5.4	5.7	5.2	5.2	5.57	5.00
Parson Brown	S. O.	50	54	52	51	4.8	5.2	5.0	4.9	5.4	5.8	5.6	5.5	5.61	4.91
Hamlin	R. L.	44	49	47	43	4.2	4.7	4.5	4.1	4.8	5.3	5.1	4.6	4.90	4.74
Sixteen to One	R. L.	49	51	45	39	4.7	4.9	4.3	3.7	5.3	5.5	4.9	4.2	5.37	4.76
Seedlings		49	54	54	54	4.7	5.2	5.2	5.2	5.3	5.8	5.8	5.8	5.64	5.21
Pineapple	R. L.	46	51	50	49	4.4	4.9	4.8	4.7	5.0	5.5	5.4	5.3	5.42	4.68

Table 2. Seasonal Changes in the Volume of Juice of Late (Valencia) Oranges.

Variety	Rootstock	Juice/100 gms. fruit				Juice/80 lbs. fruit				Juice/90 lbs. fruit				Juice Standard box (1 3-5 bu.)	
		11/8-1/3	1/4-2/23	3/1-4/25	4/26-6/20	11/8-1/3	1/4-2/28	3/1-4/25	4/26-6/20	11/8-1/3	1/4-2/28	3/1-4/25	4/26-6/20	Size 176	Size 126
				MI			Gals.				Gals.			Gals.	
Valencia	R. L.	50	52	50	46	4.8	5.0	4.8	4.4	5.4	5.6	5.4	5.0	5.33	5.13
Valencia	S. O.	53	54	55	52	5.1	5.2	5.3	5.0	5.7	5.8	5.9	5.6	5.85	5.36

whereas tests on Valencia oranges were started about December 1. The time covered by one season's experiment is indicated in tables 3 to 6.

Oranges for all the tests were selected at random, care being taken to pick only fruit from the regular bloom. Each sample consisted of about 75 oranges, 25 of which were analyzed individually. The juice of the remaining fruit was extracted by hand squeezing and aliquots of this composite sample were used in the determination of ascorbic acid and for comparative taste tests. The technique of analyses of individual fruits permitted statistical treatment of each sample. The findings showed that the samples had a normal curve of distribution, and that the variation among the fruits within samples was small. This low variability with-

in samples was constant and small for the chemical constituents of total solids and total acidity. The samples, therefore, were considered adequate to obtain the desired relative accuracy. It was also possible from these data to determine the percentage of oranges in each sample which passed or failed to pass the 8 to 1 solids-acid ratio.

In addition to the "key plots" from which systematic collections were made, several surveys were conducted during 1936-38 when different varieties of oranges of known history, rootstocks, age of trees, etc., were obtained and analyzed. The findings were in close agreement with the results obtained from the key plots, indicating that the latter were representative.

The juice of individual oranges to

be tested was extracted by a pressure extractor. Total acid was determined by the titration of orange juice with standard NaOH solution, using phenolphthalein as an indicator, the results being calculated as citric (anhydrous) acid. Total water-soluble solids were determined by an Abbe (Bausch and Lomb) refractometer and temperature corrections made on the readings thus obtained.

#### Results

Since space does not permit a complete presentation of data in this report it is deemed advisable to summarize some of the findings of particular interest to members of this society.

The greatest increase in the weight and diameter of oranges was during the period of development

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Table 3—Seasonal Changes in Physical and Chemical Constituents of Early Oranges

Parson Brown Oranges Grown on Sour Orange Rootstock							Parson Brown Oranges Grown on Rough Lemon Rootstock						
Date	Flesh Condition	Taste	Total Acid %	Total Soluble Solids %	Solid Acid Ratio	Oranges below Solid Acid Ratio 8-1 %	Flesh Condition	Taste	Total Acid %	Total Soluble Solids %	Solid Acid Ratio	Oranges below Solid Acid Ratio 8-1 %	
8/31-9/1	Ricey	V. Acid	1.98	9.28	4.69	96	Ricey	V. Acid	1.65	8.02	4.86	92	
9/13-9/16	Ricey	V. Acid	1.55	9.30	6.00	84	Ricey	V. Acid	1.58	8.14	5.15	92	
9/24-9/30	Ricey	V. Acid	1.36	9.93	7.30	60	Ricey	Tart	1.06	8.20	7.74	56	
10/7-10/14	Coarse	Tart	.96	9.33	9.72	12	Coarse	Tart	.92	8.38	9.11	16	
10/21-10/28	Coarse	Tart	.87	9.50	10.92	8	Coarse	Tart	.81	8.21	10.14	12	
11/4-11/11	Normal	Tart	.87	10.07	11.57	4	Normal	Tart	.69	8.52	12.35	0	
11/13-11/19	Normal	P. Tart	.78	10.60	13.59	0	Normal	Tart	.63	8.85	14.05	0	
12/3-12/10	Normal	P. Tart	.73	11.04	15.12	0	Normal	P. Tart	.61	9.40	15.41	0	
12/28-1/6	Normal	P. Tart	.74	11.56	15.62	0	Normal	P. Tart	.57	9.14	16.04	0	
1/13-1/19	Normal	P. Tart	.55	11.63	21.15	0	Normal	P. Tart	.48	9.42	19.63	0	
2/10	Normal	Sweet	.52	12.49	24.02	0	Normal	Sweet	.45	10.07	22.38	0	
3/13 - 3/16	S. Dry	Sweet	.49	13.41	27.37	0	S. Dry	Insipid	.40	9.67	24.18	0	

S. Dry—Slightly dry

V. Acid—Very Acid

P. Tart—Pleasantly tart

Table 4—Seasonal Changes in Physical and Chemical Constituents of Early Oranges

Hamlin Oranges Grown on Rough Lemon Rootstock							Sixteen to One Oranges Grown on Rough Lemon Rootstock						
Date	Flesh Condition	Taste	Total Acid	Total Soluble Solids	Solid-Acid Ratio	Oranges below Solid Acid Ratio 8-1	Flesh Condition	Taste	Total Acid	Total Soluble Solids	Solid Ratio	Oranges below Solid Acid Ratio 8-1	
8/31-9/1	Ricey	V. Acid	1.50	8.09	5.39	96	Ricey	Acid	1.07	7.83	7.32	44	
9/13-9/16	Ricey	Acid	1.16	8.14	7.02	72	Ricey	Tart	.86	8.06	9.37	16	
9/24-9/30	Ricey	Tart	.96	8.13	8.47	36	Coarse	Tart	.68	8.36	12.29	16	
10/7-10/14	Ricey	Tart	.96	8.02	8.35	36	Coarse	Tart	.56	7.69	13.73	8	
10/21-10/28	Ricey	Tart	.76	8.47	11.14	0	Coarse	Sweet	.41	7.77	18.95	0	
11/4-11/11	Coarse	Tart	.72	8.58	11.92	0	Normal	Sweet	.44	7.83	17.80	0	
11/13-11/19	Coarse	Tart	.76	8.79	11.57	0	Normal	Sweet	.45	7.63	16.96	0	
12/3-12/10	Coarse	P. Tart	.73	8.84	12.11	0	Normal	Sweet	.33	7.53	22.82	0	
12/28-1/6	Coarse	P. Tart	.66	8.82	13.36	0	S. Dry	Sweet	.27	6.97	25.81	0	
1/13-1/19	Coarse	P. Tart	.58	8.95	15.43	0							
2/10	Coarse	P. Tart	.58	9.31	16.05	0							
3/13-3/16	S. Dry	Sweet	.57	9.55	16.75	0							

S. Dry — Slightly Dry

V. Acid — Very Acid

P. Tart — Pleasantly Tart



# SCALE INFESTATIONS ON CITRUS DURING 1940

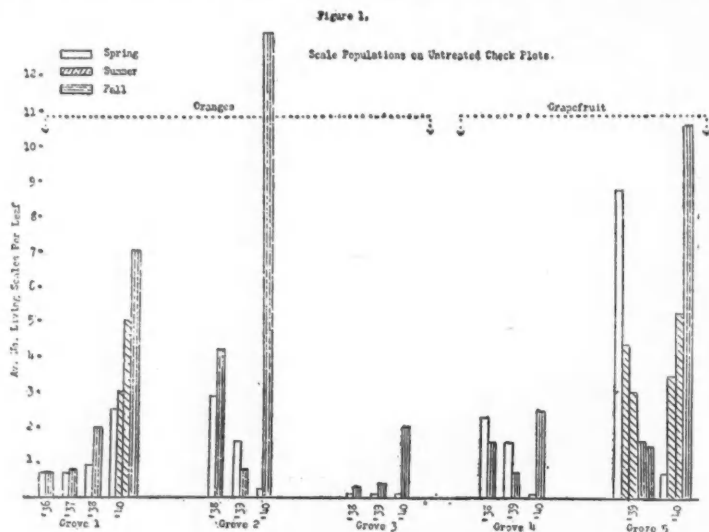
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since the work at the Citrus Experiment Station was begun. In Figure 1 are recorded the purple scale populations in untreated check plots in five different blocks that have been used for scale control studies from two to four years. These trees received neither nutritional nor sulfur

had been kept at a low level by an oil spray in 1938 and 1939, respectively, and the population was still at a comparatively low level in the fall of 1940 despite the fact that in the spring of the same year the trees had been sprayed with a neutral copper, zinc sulfate, manganese sulfate, and lime spray at the rate of two pounds each per 100 gallons, a formula commonly used during the spring of 1940. The plot was sprayed with oil

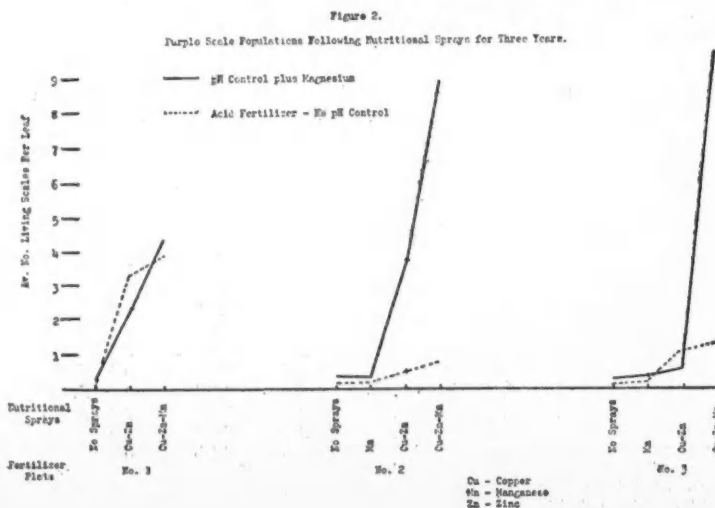
Grove 4, consisting of grapefruit trees in very good condition, was located in a very cold area. There was not a heavy leaf drop immediately following the freeze, but during April a fairly heavy leaf drop occurred. The mortality of scales was rather high in this grove following the freeze and the subsequent leaf drop, which resulted in a very light infestation of scales by May 1. As recorded in Figure 1, the purple scale infestation had steadily declined in this plot during 1938 and 1939, but during 1940 the infestation increased from a very low level to one higher than in the spring of 1938. Much heavier infestations of whiteflies and rust mites also developed on the trees in Grove 4 during 1940 than in the two previous years. In Grove 5 it is interesting to note the reverse of the scale population from a high level to a low level in 1939 and from a low level of infestation to a high level in 1940. The increase of purple scales was very definite in 1940 in all other untreated or check plots not discussed in this article, whereas during other years the increase or decrease was not so marked except in Grove 5 where a very definite decrease occurred in 1939.

Heavy infestations of Florida red scales were quite common in 1940. Some extremely heavy infestations developed on the East Coast, especially in the vicinity of Vero Beach and Fort Pierce, but infestations were common all along the East Coast where citrus is grown. In central Florida red scale infestations were also more common than usual. In some groves in the Lake Alfred area that have been under observation for five to eight years, red scales



nor oil sprays in 1940; and with the exception of the 1940 check plot in Grove 5, which received a copper spray in 1939, none of them have ever received any copper sprays. In Grove 1 the scale population remained at about the same level during 1936 and 1937, but there was an increase in 1938. No counts were made in 1939. In 1940 scale counts were made from this grove on March 25, July 9, August 16 and October 25, respectively. The increase in population was much more marked in 1940 than in any other year, and very decided increases developed between July 9 and October 25. In Grove 2 there was an increase of scales during 1938, a decided decrease in 1939, and during 1940 the scales increased more in that grove than in any of the others. This grove was in a cold area and the scale population had been reduced to a low level by a heavy leaf drop estimated at 75 to 85 per cent. Many of the leaves dropped in February, and another leaf drop occurred in April. The heavy infestation of scales in the fall of 1940 on the leaves originating from scales on the wood illustrates the value of thorough inside spraying with oil sprays. In a plot six rows away from the check plot the scale population

in the summer as in the two previous years. In Grove 3 the scales had never been a problem even in plots where zinc sprays were applied for the last three years with no oil sprays, and there was a light infestation of scales until 1940. In that year the rate of increase was almost as great in the check plot as in those plots receiving a zinc-lime spray.



Cu - Copper  
Mn - Manganese  
Zn - Zinc



appeared in noticeable quantities for the first time during that period. An examination of red scales in October from several groves showed that a very high percentage of them were living which is unusual for that time of the year. In one grove 85 percent of the female scales were living. Of the 15 percent that were dead, less than one-half of them had died prematurely and the remainder were females that had completed their life cycles.

Dictyospermum scales, which are usually of little economic importance on citrus, were of major importance in several sections of the State. Whether the outbreak of this species of scales was caused by seasonal conditions or whether this species will be a permanent pest of economic importance in Florida remains to be seen.

#### Influences of Cultural Practices on Purple Scale Development

Although the seasonal conditions during 1940 have been most favorable for purple scale development, some of the cultural practices now in common use have also been indirect factors in creating conditions for scale development. Trees that have been receiving magnesium, zinc, copper, and manganese in addition to the regular elements of nitrogen, phosphorus, and potassium are usually well foliated and have a high percentage of green leaves throughout the year, which condition, as the writer has already reported (4), is favorable for purple scale development. There is no doubt that sprays containing residues such as precipitates of copper, zinc, and manganese are factors favorable for purple scale development, but the condition of the trees is also a definite factor. Magnesium, which is always applied on the soil, probably has been more responsible for the general improved tree condition than any one of the other elements yet the use of zinc, copper, and manganese has also contributed to a more vigorous and permanent growth of the tree. One has only to recall the condition of the average grove four or five years ago to picture the change that has taken place in most of the groves. At that time it was a common occurrence, from August until the spring flush of growth came out, to see numer-

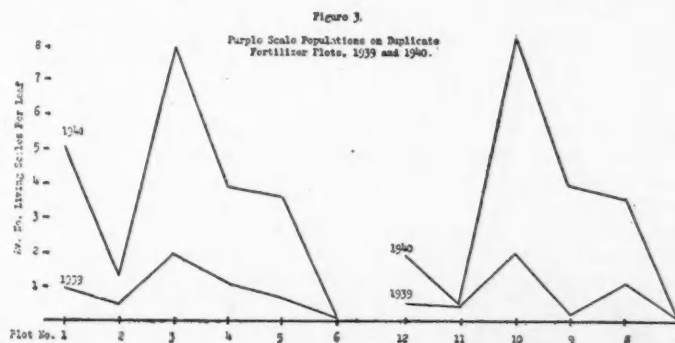
ous groves in a bronzed (magnesium deficiency) or frenched (zinc deficiency) condition or a combination of the two conditions. Purple scales do not infest bronzed leaves or frenched leaves to the extent that they infest healthy green leaves so purple scales were not so difficult to keep under control in groves that had a high percentage of bronzed leaves even though sprays containing compounds of copper, zinc, and manganese had been applied. In experimental fertilizer plots the scales were much more abundant on the trees in plots treated with magnesium than in plots where magnesium was omitted from the fertilizer formula. The differences in scale infestations were very marked in several fertilizer experiments that have been conducted at the Citrus Experiment Station during the last three years in which the writer has collaborated in studying the effects of various cultural practices on insect development. In Figure 2 are recorded the purple scale infestations in a fertilizer experiment that has been conducted for three years.

There were three original plots and these were divided in halves so that the north half received magnesium derived from dolomitic limestone and magnesium sulfate. Sufficient additional limestone was applied to maintain a pH of between 5.8 and 6.0. The south half of each plot received no magnesium nor limestone, and the pH ranged from 4.9 to 5.1. Other than this the fertilizer treatment in each individual plot was the same. Both the north and south plots were divided into four parts in the following order: No spray, manganese spray, copper-zinc spray, and copper-zinc-manganese spray, these being applied to study the nutritional

value of the various elements. Population counts of purple scales were taken in November, 1940. In Figure 2 the solid lines represent the scale populations on leaves from the trees in the half of the plot which received magnesium and limestone, and the broken lines represent the population on leaves from trees in the portion of the plot which received no magnesium or limestone.

The purpose of discussing the scale infestations in the fertilizer plots is to stress the point that nutritional sprays are only a contributing factor and not the primary factor in the more recent scale infestations. The results indicate that the combined nutritional value of magnesium, copper, zinc, and manganese in producing larger and more vigorous trees appears to have been more of a factor in creating conditions favorable for scale development than the residues from any sprays. On an average the scale infestation was lower in the portion of each plot receiving no magnesium and the pH of the soil was at a lower level than in the portion of the plots that received magnesium and the pH had been maintained at a higher level. (See Figure 2.) Where magnesium was applied the trees had a high percentage of green leaves, were thickly foliated and larger than where magnesium was deficient and the soil acid. In the plots in which magnesium was deficient and the trees lightly foliated, the scale infestations were light even following a nutritional spray of copper, zinc, manganese, and lime at the rate of 3-3-3-6-100; but where the same spray combination was applied on trees in good condition the scale infestation was much heavier. The infestation was not nearly so

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All plots received a fertilizer containing nitrogen, phosphorus, and potassium. Plots 1, 3, 4, and 5 and the respective duplicate Plots 12, 10, 9 and 8 received magnesium, copper, zinc, and manganese on the soil and also the latter three elements in a spray. Plots 2 and 11 received the same treatment as the above plots except magnesium was omitted. Plots 6 and 7 received no magnesium, copper, zinc, or manganese.

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## The Citrus Industry

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Exclusive publication of the Citrus Growers and Shippers

Publication office 550 North Broadway, Bartow, Florida 269  
Telephone

Published Monthly by  
ASSOCIATED PUBLICATIONS CORPORATION  
S. L. FRISBIE - - - - - President-Editor  
S. LLOYD FRISBIE - - - - - Sec.-Treas.-General Manager  
LOYAL FRISBIE - - - - - Business Manager  
A. G. MANN - - - - - Production Manager

Subscription, \$1.00 per year in advance  
Outside Continental United States, \$2.00 in advance

### STUDYING CITRUS ADVERTISING PROGRAM

The action of the Florida Citrus Commission in instructing its advertising committee to make a thorough and careful study of the advertising program under which approximately one million dollars is being spent this year, is very commendable.

There may be nothing wrong with the present advertising program, but the question has been raised by members of the Florida Citrus Producers Trade Association and the growers who contribute this advertising fund through a box tax on grapefruit, oranges and tangerines, are entitled to know just what is being done with their million dollar contribution, and how effective the program is proving to be.

If, as the Florida Citrus Producers Trade Association asserts, the approximately sixty percent of the entire fund allotted for radio broadcasts is not bringing satisfactory results, then something should be done about it. If, on the other hand, as one member of the Citrus Commission suggests, the trouble is in "the kind of fruit we are shipping," then certainly something should be done about that, but, judging by past experience, very little may be expected along that line. As Mark Twain said about the weather: "Everyone is talking about it, but no one is doing anything about it."

Heretofore, the major part of the advertising fund has been spent in newspapers and magazines, but this year radio broadcasts have been allotted the major portion of the fund, whether wisely or not is one of the questions to be determined by the study being made by the advertising committee.

Growers have contributed willingly and gladly to this fund for commodity advertising of their product, with the expectation that the money would be wisely spent and that it would bring satisfactory results. They are entitled to know whether or not this is being done. The report of the study by the advertising committee of the Citrus Commission, due to be made as this issue of The Citrus Industry is going to press, should go far toward clarifying the situation and giving the growers accurate knowledge of what the advertising program is doing for them.

Every grove owner will find instructive information in Dr. W. L. Thompson's article on scale insects printed elsewhere in this issue.

### CITRUS JUICES AND THE "FLU"

With this nationwide epidemic of influenza, too much stress cannot be placed upon the preventative and curative powers of citrus juices, particularly grapefruit juices.

Fortunately, most physicians are familiar with the beneficial effects of citrus juices in the treatment of the malady and are advising their patients to make liberal use of them before, during and following an attack of the flu.

The Florida Citrus Commission is doing valuable work along this line by cooperating with physicians and public health authorities in spreading accurate knowledge of the benefits to be derived from a liberal use of citrus juices at this time.

### "MORE PEOPLE BUYING MORE FRUIT"

The above are the words of Dr. J. W. Lloyd, marketing and farm research expert of the University of Illinois, on a recent visit to Florida.

Dr. Lloyd does not believe that we are producing an oversupply of citrus fruits, but that our principal problem is to "find a way to get surplus fruit to hungry mouths."

Just how this is to be done, Dr. Lloyd did not say, but he did indicate that the production and sale of quality fruit, better marketing system and greater effort in selling might contribute to the solution of our surplus fruit problem.

With "more people buying more fruit," and with more people having the purchasing power to buy still more fruit, citrus growers should, and if they will work together we believe they will, find a way to sell more fruit.

### AN ENVIABLE CITRUS ISSUE

The Mission, Texas, Times, recently issued its eighth annual Citrus Fiesta Edition, which was a most enviable issue. Containing sixty-four pages, the issue gave in much detail the origin, growth and present status of the citrus industry in the Lower Rio Grande Valley.

The issue contains much valuable information on the industry in Texas which might conceivably be of interest to citrus growers in Florida, and with the permission of the publishers of the Times, The Citrus Industry hopes to present some of this data in future issues of the magazine.

There is a vast difference between a grove owner and a citrus grower. Almost anyone with a little money may own a grove, but it takes an expert to be a citrus grower.

Time for spring application of fertilizer is here. The wise grower will not neglect this important grove requirement.

The time of year is now at hand when citrus growers should be on the lookout for an infestation of citrus aphids.

Reports from Texas are that the grapefruit deal in that state will close early this season.

## Gift Box Shippers Seek State Control

At a meeting in Lakeland on Jan. 15, a number of shippers of citrus gift boxes and road side citrus dealers inaugurated a movement to secure state control of out-of-state shipments by small dealers. An organization will be perfected and the next session of the state legislature will be asked to enact legislation to be proposed by the organization.

A committee composed of eighteen men, one from each of the counties represented at the Lakeland meeting, was appointed and will meet in Winter Haven on January 31 to draft the proposed legislation. State Senator A. W. Young of Vero Beach was named as temporary chairman of the committee.

Secretary Charles F. Chastain and other spokesmen for the Florida Citrus Commission stated that the meeting was called to enable the express shippers and roadside dealers to work out their own problems, and that the commission was not attempting to impose any regulations of its own.

A. S. Clark, chairman of the commission's express committee, said the services of the commission's attorney and other aid would be given to the dealers in working out their program. The result of a commission survey of 700 dealers made last year was turned over to the dealers' committee.

The dealers said they wanted some control to prevent shipment of inferior fruit to consumers out of state.

The following are members of the dealers' committee named at the Lakeland meeting:

A. W. Young, Indian River county; T. L. Benson, Palm Beach; C. R. Stone, Volusia; A. V. Barnard, Marion; B. I. Garving, Brevard; W. L. Fee, St. Lucie; C. E. Myers, Dade; Ben F. Haines, Seminole; T. C. Jacobs, Orange; O. W. Conner, Lake; A. F. Pickard, Polk; George E. Judd, Lee; Paul R. Rumpsa, Highlands; R. Dehaven, Hillsborough; F. L. Campbell, Pinellas; Meade Smith, Manatee; E. E. Stackpole, Sarasota; Max Scheuer, DeSoto.

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**AM-O-NITE, 15% nitrogen, quick-acting  
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oxide. A truly first-class Top  
Dresser.**

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grades, and a formula for every  
requirement.**

**TENNESSEE BASIC SLAG — rich in phos-  
phates, calcium, manganese, mag-  
nesium, and other necessary minor  
elements. The soil conditioner par  
excellant.**

Our Program is modern and economical, and truly helps the grower to produce **BETTER FRUIT AT LOWER COST.** (If you want early fruit, we can help you. If you want it late we can also help you). Will you not give our competent and experienced field representatives an opportunity to discuss your problems?

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## SLOAN'S SERVICE SUGGESTIONS

BY G. D. SLOAN

It is not often that in one season our agricultural industry experiences as many handicaps as have been experienced during our fall season — first, a drought; second, an early freeze; third, low prices for our fruit and most of our vegetables. In spite of all of this, however, the agricultural industry in Florida, and in that I include both citrus and vegetables, is on a much sounder basis and the future appears brighter than it has for a number of years.

Growers throughout the state are realizing the importance of quality produce, improved appearance of their citrus fruits and an improved eating quality. More interest has been taken during the past few years, and is being taken now, in proper soil condition and a proper fertilization program than has ever been taken before. It is becoming more apparent all the time that economic production of high quality produce depends on a well balanced soil fed with a well balanced plant food. The soundness of this program has been demonstrated many, many times by us through our soil work with growers and through the use of our EXTRA VALUE VITAL ELEMENT BRANDS.

The soil is the stomach of plant life. The food consumed by the plant must be digested in it and supplied in a form compatible to the plant life being fed. If this is not done, nutritional disorders occur. Just as truly as if a man is fed improper food, he suffers the consequences.

We do not claim that all the problems connected with plant feeding have been solved. We do not claim our EXTRA VALUE VITAL ELEMENT BRANDS are perfect. We do claim that progress has been made and that in these we have produced a better fertilizer. As more knowledge is gained, these brands will be improved accordingly.

We are entering into a new year and we want to thank our customers and friends for the confidence they have reposed in us during the year just closed. We are highly pleased with our operations for 1940. Not only in our increased business and the number of new friends and customers we have made, but in the added results we have been able to se-

cure for our customers.

Our business is one of great responsibility, and by far our greatest responsibility is to those good growers who have placed confidence in us by favoring us with their business. We are glad to assume this responsibility, and in starting 1941, we pledge an increased effort in their behalf.

Due to the continued fall and early winter drought, many citrus growers did not make their normal fall or winter application of fertilizer until after Christmas. As a matter of fact, some are still, at the time of this writing, January 15th, applying what would have been, under ordinary season conditions, a fall application.

Where the application has been delayed this late, it has been our recommendation, and is being followed by most of our customers, that a complete fertilizer be used and the poundage be increased sufficiently to replace the Top Dresser application ordinarily made at this season of the year.

Where the fall or winter application was made prior to January 1st and in normal amounts, a Top Dresser is certainly to be recommended. Our experience has convinced us that the best time to apply this Top Dresser is just as the bloom buds begin to show. If it is applied too soon, an abnormally early growth may result and the amount of bloom produced be reduced rather than increased. On the other hand, if it is applied too late, that is after the bloom is well open, considerable of the effectiveness is lost. We, therefore, recommend very strongly that trees be watched for an indication of bloom, and as soon as it is apparent, the Top Dresser be applied.

Growers will find our DOUBLE X TOP DRESSER to be unequalled in the Top Dresser Field. It carries Soluble Nitrogen in three forms and an unusually large quantity of Magnesium, Manganese and Copper.

Our experiments with Top Dressers covers a period of more than eighteen years, and we can say, with all sincerity, that we have been able to produce better results for our customers with DOUBLE X TOP DRESSER than any other we have ever before seen used.

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Build Crops

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WRITE THESE EXTRA-VALUE VITAL ELEMENT BRANDS INVARI-  
F.

Remarkable growth of our business can only be attributed to the ex-  
traordinary results Florida growers secure from Superior's Extra Value  
Vital Element Brands of Fertilizers—Let our experienced Florida field  
men tell you why Vital Element Brands are better.

## Superior Fertilizer Company

G. D. Sloan, Pres.,

P. O. Box 1021

Head Office East Broadway At 47th Street, Tampa, Florida



### SEASONAL CHANGES IN THE PRINCIPAL VARIETIES OF FLORIDA ORANGES

(Continued from page 7)  
prior to the attainment of prime eating quality, while less rapid and ir-

rootstock regreened but slightly; however, when grown on rough lemon rootstock on light sandy soils they showed more regreening, especially from April and throughout the remainder of the shipping season. Late in the season, Valencia oranges

lencia oranges grown on sour orange and sweet orange, grapefruit and Cleopatra rootstocks had more juice than when grown on rough lemon rootstock, especially in the case of young trees.

(Continued on page 15)

Table 5—Seasonal Changes in Physical and Chemical Constituents of Midseason Oranges

Seedling Oranges							Pineapple Oranges Grown on Rough Lemon Rootstock						
Date	Flesh Condition	Taste	Total Acid	Total Soluble Solids	Solid-Acid Ratio	Oranges below Solid Acid Ratio 8-1	Flesh Condition	Taste	Total Acid	Total Soluble Solids	Solid-Acid Ratio	Solid Acid	Oranges below Solid Acid Ratio 8-1
			%	%		%			%	%			%
8/31-9/1							Ricey	V. Acid	1.72	7.97	4.63		100
9/13-9/16	Ricey	V. Acid	2.33	9.34	4.01	100	Ricey	V. Acid	1.46	7.57	5.18		100
10/7-10/14	Coarse	V. Acid	2.13	9.88	4.64	96	Ricey	Acid	1.16	7.71	6.65		96
10/21-10/28	Coarse	V. Acid	1.82	9.80	5.38	100	Coarse	Acid	1.06	8.33	7.86		44
11/4-11/11	Coarse	V. Acid	1.72	10.54	6.13	100	Coarse	Tart	.96	9.19	9.57		4
11/13-11/19	Coarse	V. Acid	1.59	10.85	6.82	92	Coarse	Tart	.93	9.64	10.37		0
11/22-11/26	Normal	V. Acid	1.73	11.25	6.50	92							
12/3-12/10							Coarse	Tart	.91	10.27	11.29		0
12/16-12/26	Normal	Tart	1.32	12.15	9.20	8							
12/28-1/6	Normal	Tart	1.33	12.16	9.14	0	Normal	P. Tart	.87	10.67	12.26		0
1/13-1/19	Normal	Tart	1.39	12.81	9.22	0	Normal	P. Tart	.74	10.74	14.51		0
2/10	Normal	Tart	1.24	13.75	11.09	0	Normal	P. Tart	.77	11.02	14.31		0
3/1-3/7	Normal	P. Tart	1.21	14.07	11.63	0							
3/13-3/16							Normal	P. Tart	.77	12.00	15.58		0

V. Acid — Very Acid

P. Tart — Pleasantly Tart

regular increase occurred during later stages of ripening. Both Parson Brown and Valencia oranges were greater in weight and diameter when grown on rough lemon than when grown on sour orange rootstock.

The fruit within each sample was fairly uniform in the color of the rind. The extent to which early and midseason oranges degreened depended on the variety and length of time the fruit remained on the tree. Ripe Boone's Early and Homosassa had paler rind than ripe Parson Brown, Pineapple, Corner's Seedless, Seedlings or Jaffa oranges. There was no significant amount of regreening in early and midseason oranges although the investigation was extended long beyond the time the fruit was in prime condition and long after the flush of spring growth had begun.

Valencia oranges had a deeper orange-colored rind when grown on sour orange than when grown on Cleopatra, sweet orange, grapefruit or rough lemon rootstocks. During the commercial shipping season, Valencia oranges grown on sour orange

showed a small amount of regreening, which occurred mostly around the stem end and was more pronounced when they were grown on rough lemon rootstock.

The thickness of the rind of all varieties of oranges tested ranged between 3 and 5 millimeters and averaged about 4 millimeters. There was little or no change in the thickness of the rind of most of the varieties with the ripening of the fruit. Valencia oranges had a slightly thinner rind when grown on Merrit Island than when grown in Central Florida.

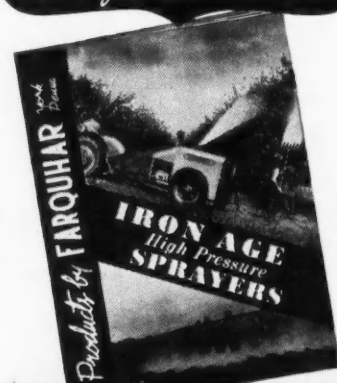
In tables 1 and 2 it will be noted that all of the oranges tested were always fairly high in juice. The most juice was found when the fruit was in "prime condition," and high juice content per box was correlated with smaller sized fruit.

On a fresh weight basis Parson Brown oranges grown on sour orange rootstock contained more juice than fruit of the same variety grown on rough lemon rootstock.

Slightly higher quantities of juice were found in Conner's Seedless, Jaffa, and Seedlings than were found in the other midseason varieties studied, Homosassa and Pineapple, or in the earlier varieties of oranges.

Valencias from Merrit Island contained more juice than the same varieties from Central Florida grown on the same kind of rootstocks. Va-

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# SEASONAL CHANGES IN THE PRINCIPAL VARIETIES OF FLORIDA ORANGES

(Continued from page 14)

Some of the more important constituents affecting the flavor of orange juice are: degree of acidity, percentage of sugar, proportion of acidity to sugar, and aroma. Few people, if any, want immature fruit of relatively high acidity or insipid fruit of low acidity or fruit of low acidity and low total solids.

The juice of Sixteen to One oranges did not attain high quality because of low acidity and solids. The juice of Seedling oranges had high acidity and high solids and attained very high quality when the fruit was left on the tree for a sufficient length of time. Rootstocks upon which Parson Brown and Valencia oranges were grown influenced the quality of the juice. Higher quality resulted when the fruit was grown on sour orange than when it was grown on rough lemon rootstock.

Data on the ascorbic acid or Vitamin C content of Florida oranges were presented at the Florida State Horticultural Society Meetings in 1939. It was pointed out at that time that no correlation was found between the ascorbic acid content of orange juice and its quality as judged by taste. However, oranges picked from outside branches which were well exposed to sunlight contained significantly more ascorbic acid than inside shaded fruit.

A gradual decrease in total acidity with the ripening of the fruit characterized all the varieties studied. However, acidity decreased most rapidly early in the season when the fruit was less mature than it did later. Details are shown in Tables 3 to 6.

Of the early varieties, Parson Brown on sour orange and Hamlin on rough lemon rootstocks averaged highest in total acidity and Sixteen to One was lowest.

Rootstocks were found to influence the acid content of Parson Brown and Valencia oranges, in that the fruit contained higher acidity when grown on sour orange than on rough lemon rootstock.

Midseason varieties of oranges contained larger percentages of total acid than were found in early oranges. Most midseason oranges when ripe averaged about 1.00 percent acid, whereas, early oranges when ripe ranged between about .65 to .80 percent.

Total solids generally increased as the fruit developed and ripened on the tree as shown in tables 3 to 6,

except in overripe fruit sampled very late in the shipping season in which a decline in solids was noted.

Rootstocks were found to have a definite influence on the content of total solids. The highest percentages were found in Parson Brown and Valencia grown on sour orange rootstock with lower percentages in those grown on rough lemon rootstock.

Of the early varieties, Sixteen to One oranges contained the lowest solids. Among midseason varieties Conner Seedless, Seedlings and Jaffa oranges had higher solids than Pineapple or Homosassa.

The ratio of total solids to acidity may be very misleading as a meas-

ure of quality. A high ratio does not necessarily mean superior quality and a low ratio does not always indicate inferior quality. In fact, fruit with a low ratio may be far superior in quality to that with an unusually high one.

(Concluded next issue)

## WARD GOES TO HENDRY

Dewey H. Ward, for several years county agent in Lafayette county at Mayo, has been transferred to Hendry county, with headquarters at LaBelle, it is announced by A. P. Spencer, vice director of the State Agricultural Extension Service. Ward is already working in his new location.

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Compare the condition of the trees and the size and quality of the fruit in groves using NACO Products and Service with others in your section and you'll have convincing proof of the soundness of the common-sense NACO Plan for fertilizing, spraying and dusting citrus.

## NACO 5 \*\*\*\*\* Special Fertilizer

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# SCALE INFESTATIONS ON CITRUS DURING 1940

(Continued from page 9)

heavy in plots receiving one or two of the elements as in those plots receiving three of the elements. These results follow closely the results obtained from other experiments where varying combinations of the nutritional or so-called residue sprays were applied. When an application of an oil spray has been made during the summer there has been little trouble in controlling purple scales in groves that have been sprayed with either copper or a combination of copper and zinc. Where copper, zinc, and manganese have been applied during the same year, scale control has not been satisfactory, especially where there was a medium-to-heavy infestation of scales when the spray was applied. Camp and Fudge (1) state that on sandy soils one to four pounds of manganese sulfate per tree is used as a corrective treatment followed by much smaller amounts in the fertilizer for maintenance. As stated by Camp and Fudge, it will not be necessary to apply the manganese as a spray except when immediate results are desired or where the trees are planted on alkaline soils. On the latter soils it is necessary to apply yearly from two to ten pounds of manganese sulfate per tree in order to keep the trees in good condition so the spray is usually found to be more economical. As shown in Figure 2, Plots 2 and 3, the scales did not increase where manganese alone was applied, and there was not an undue increase with a combination of copper and zinc; but where copper, zinc, and manganese were applied there was a decided increase so it would seem that where practical manganese should be applied to the soil to lessen the possibility of heavy scale infestations.

The last statement concerning the increase of scales following nutritional sprays may seem somewhat contradictory to a former statement that the scale increases were due more to the condition of the trees than to the residue. As stated by the writer in a former paper (4), scale infestations were heavier following sprays containing large amounts of residue, 8 to 20 pounds per 100 gallons, than following sprays containing lower amounts of residue, 2 to 6 pounds per 100 gallons. Since inert residues on leaves are considered factors in scale development, it is logical to expect a sharper increase of scales on trees with a combination of suitable foliage with residue on

the leaves than on trees with residue on foliage unsuitable for scale development.

In another fertilizer experiment at the Citrus Experiment Station the purple scale infestations varied according to the condition of the trees very much as they did in the experiment discussed previously. This experiment has been conducted for three years in a grapefruit grove divided into duplicate plots, receiving different fertilizer treatments. Magnesium was included in the formula of the fertilizer used on all of the plots except two sets of duplicates. Copper, zinc, and manganese were applied both as a spray and as soil treatments in all of the plots except one set of duplicates. The whole block received sulfur sprays for rust mite control and has also been sprayed once a year with an oil emulsion at a concentration of one percent actual oil. The one percent concentration of oil was used instead of one and one-fourth percent

or a stronger concentration so that any differences in scale infestations due to cultural practices would be marked. In the following table are recorded the materials which the respective plots received, and in Figure 3 will be found the purple scale populations for 1939 and 1940.

(See Table on next page.)

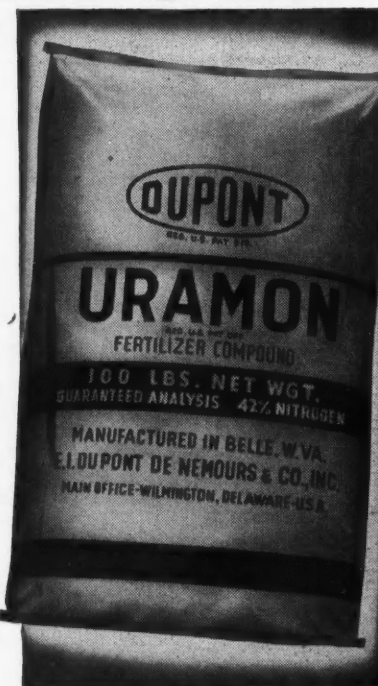
In plots where magnesium had been included in the fertilizer formula, the trees had a high percentage of green leaves, were well foliated, and in good general condition. Scales were more abundant on those trees than on trees in plots where magnesium had been omitted from the fertilizer formula. The trees in those plots were smaller, sparse of foliage, and had a high percentage of bronzed leaves. In Figure 3 is a concrete illustration of the difference in purple scale infestations in plots fertilized and sprayed exactly alike except that magnesium was included in the fertilizer in one set of plots and omitted in the other set.

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"URAMON" urea nitrogen fertilizer was first offered for sale three years ago. Today, because of its high efficiency, its low cost, and its good mechanical condition, "Uramon" is one of the important nitrogen carriers used by fertilizer manufacturers and growers. The high efficiency of "Uramon," a water-soluble organic, is due largely to its **complete availability, resistance to leaching, and low equivalent acidity.**

Used in nitrogen-potash top-dressers and complete fertilizers, "Uramon" gives a sustained effect in addition to the quick action usually obtained from soluble sources of nitrogen. Used as a material for direct application, the quick action and long-lasting effect obtained from "Uramon" has caused many growers to recognize the value of this nitrogen fertilizer.



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In Plots 3 and 10, where magnesium was applied the scale infestation was much heavier than in Plots 2 and 11, where no magnesium was used. It should be noted that Plots 2 and 11 received the nutritional spray, yet the scale infestation was

The factors of vigorous tree growth combined with a season that has been naturally favorable for scale development have been responsible to a great degree for the heavy scale infestations with increasingly heavier infestations occurring where

growth comes out so that a better check can be made before the new growth obscures many of the infested leaves and twigs. If scales are present on either leaves or twigs, plans for a summer oil should be made. Even where oil has been applied this winter another application should be made next summer to insure satisfactory control and prevent the recurrence of heavy infestations again next fall.

Plots	Fertilizer Treatment	Nutritional Sprays
1, 3, 4, 5, 8, 9, 10, and 12	N-P-K plus magnesium and copper, zinc, and manganese	Copper, zinc, and manganese
2 and 11	N-P-K plus copper, zinc, and manganese	Copper, zinc, and manganese
6 and 7	N-P-K	

very light. The lightest infestations were in Plots 6 and 7 which received no magnesium nor copper, zinc, or manganese in a spray or fertilizer. The trees in those plots were small and sparse of foliage but were of the same age as the other trees in the grove. All of the other plots in the grove received magnesium, and the scale infestations were heavier in those plots than in any one of the plots where magnesium was omitted.

copper and/or nutritional sprays were applied without adequate oil sprays for scale control. At present there is a heavier infestation of scales in most groves than is usual at this time of the year. The scales are especially numerous on the wood which fact will make it very necessary to thoroughly spray the inside of the trees when the oil sprays are applied. Close inspections for scales should be made before the spring

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4. Thompson, W. L. Some possible reasons for the increase of purple scale infestations. *Citrus Industry* 19 (12): 6-7, 17, 20. 1938.

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## Reports of Lyons Field Men . . .

### SOUTHWEST FLORIDA

**F. W. (Felton) Scott**

Growers in the Ruskin-Palmetto area are well under way with their spring plantings of truck crops, with tomatoes, pepper and lettuce predominating as far as acreage is concerned. Iceberg lettuce has proven to be a splendid addition as a principal truck crop in this section. Recent rains severely damaged celery in Manatee and Sarasota counties resulting in poor quality and very short production. Citrus growers have hailed the recent rains, and with orange prices getting better are feeling in higher spirits even though the price of grapefruit is still below the cost of production.

### POLK & HIGHLANDS COUNTIES

**J. M. (Jim) Sample**

This area has had and is having some excellent January rains that came not too soon for most groves. However, now soil moisture is good and trees have all responded and for the most part are looking normal again. Rust mites increased their activities during middle January and before control measures were applied did some damage. The activity of scale was somewhat decreased, but was serious for a while. Scale is still prevalent in some cases and growers are planning an early application of oil emulsion. Fruit prices are looking better. There is getting to be definite scarcity of mid-season oranges. A few valencia crops have been sold for \$1.00 and \$1.25 for future movement. There are indications that the grapefruit prices are gradually becoming firmer.

### HILLSBOROUGH & PINELLAS COUNTIES

**C. L. (Charlie) Little**

Groves in this section have shown a big improvement in their condition and appearance since the rains started several weeks ago. While we suffered a heavy drop of fruit as a result of the drought, and especially grapefruit, it is very pleasing to note that at the present time the drop-page is very light. We have ex-

perienced a heavy loss of oranges from splitting, but I am glad to report this has about stopped.

### EAST COAST

Rains have played havoc with all crops around the Lake and on the East Coast. However, if favorable weather will prevail from now on through the remainder of the season growers are hoping that the price received for their produce will offset the curtailed production. Beans and all other products in this section have been bringing fair to good prices.

### NORTH CENTRAL FLORIDA

**H. C. (Doug) Douglas**

January and the new year brought quite a bit of activity in the groves in this section. Growers all over the territory have been busy with their fertilizer application and are thoroughly cultivating their properties. There still remains a considerable tonnage of mid-season fruit throughout this section and the price has been better. There is a general optimistic feeling that valencia oranges are going to bring a good price. We still have lots of grapefruit. Those growers that have not already made their fertilizer application are planning to go forward with it immediately.

### WEST CENTRAL FLORIDA

**E. A. (Mac) McCartney**

It is a pleasure to report that we have a feeling of optimism prevailing in this territory. With the drought and other adverse conditions all during the fall it was a continuous story of pessimism, but now I am feeling better and this feeling is shared with both the vegetable and citrus growers of this section. Strawberry growers in the Plant City section are receiving good prices for their berries, and while the production is considerably curtailed, the price being good will compensate to some extent. Fruit prices are better and the expectancy is running high as far as valencias are concerned. Growers are going forward with their spring application of fertilizer and are already making plans for their summer mixture.

## Horticultural Hints

The prospects for a heavy bloom are good all over the citrus belt, with most groves vigorous and growing. Bloom was noted in many sections in January. It is very necessary to supply the tree with ample amounts of the proper plant foods at this time. If you haven't already made your spring application of fertilizer, now is the time to get in touch with the Lyons Field Man and have him advise with you regarding the proper mixture to be used. This application should contain the necessary secondary plant foods to take care of the requirements of the tree.

Experimental data has definitely shown that the secondaries should be applied at this time. Our Field Men are thoroughly capable of giving you the latest information regarding the necessary materials to use to maintain the proper balance in the tree. Growers throughout the citrus area are planning to put forth every effort to produce quality fruit during the coming season, and this can be accomplished only through the judicious use of the proper spray materials.

From now on until the next crop is harvested you will be able to obtain valuable information regarding the proper materials and the proportion in which they should be used from our Service Men. Consult them freely.

The heavy rains during January has leached a considerable portion of your soluble nitrogen out of the feeding zone of your plants. This is especially important in the case of vegetable crops, and it is extremely important that you replace this at the earliest possible moment. We want to particularly urge the growers to guard against infestation of melanose early this spring. Conditions have been most favorable for melanose development, and unless the proper spray program is followed to control this we are going to have some poor quality fruit. Keep a close check on your valencia oranges for rust mite. These pests have been quite prevalent during recent weeks, and if they make an appearance they should be controlled immediately.

## H. E. (ED) CORNELL,

President,  
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Here is what Mr. Cornell says:

"We have been using Lyons fertilizers ever since the Company was first organized. We believe that this fertilizer we use, containing all the essential plant food elements including secondary elements, is an important factor in enabling us to grow and deliver to our customers the best trees that can be grown."

Such unqualified praise coming from the president of the Largest Citrus Nursery In The World, located at Dundee, Florida, cannot fail to serve as an authentic and responsible statement of fact.

Along with a great many other large growers Mr. Cornell orders his fertilizer on the

basis of its reliability and productive capacity.

Naturally we are proud to add Mr. Cornell's testimony to the long and growing list of others who find in Lyons Fertilizers everything they need to produce Quality Trees and Crops.

## Heavy Increase In Shippers of Florida Citrus Fruits

Based on present indications, the number of citrus fruit dealers in Florida this season will far exceed that of last year. On January 15, 580 licenses had been granted and bond posted for each, according to Chas. F. Chastain, secretary of the Florida Citrus Commission. This represents a sum of \$785,000 in bonds posted. In contrast to the number thus far, 543 licenses were granted for the entire 1939-40 season.

"The system of bonding and licensing citrus fruit dealers has, according to general information, nearly eliminated unscrupulous dealers who in the past made a practice of defaulting in their debts to growers. This change for the better can be at-

tributed to the fact that the Citrus Commission since 1939, by power of a legislative act passed that year, has authority to look into the financial history and the previous business integrity of an operator in passing upon his license application. This further assures the citrus producer of his just returns," Mr. Chastain said.

Under the law, every person who wishes to act as a citrus fruit dealer, must first obtain a license and post a bond. Application for the license, which is issued by the Commissioner of Agriculture, must be made to and approved by the Florida Citrus Commission at its Lakeland offices. However, before the license is granted the applicant must supply the Commissioner of Agriculture with either a cash bond or one executed by a surety company. The amount of the bond is based upon the quantity of fruit which the applicant intends to handle, being \$10 for each 100 boxes. The minimum bond, however

is \$500 and the maximum \$10,000.

Citrus Commission officials emphasize that it is important that a grower sell only to licensed dealers, and thereby assure himself of full compensation in the event some attempt is made to default in payment: Claims for delinquencies may be filed with the Commissioner of Agriculture up until September 30th, as bonds remain in force for 49 days beyond June 30, expiration date of licenses.

### GIFTS FOR VETERANS

Life was made brighter for patients at the United States Veteran Hospital in Lake City during Christmas by Duval County home demonstration club women. Directed by their home agent, Miss Pearl Laffitte, the women prepared 243 bags of crystallized fruit peel and honeyed pecans and sent them to the veterans.

Be sure to see  
**Florida State Fair**  
Tampa FEB. 4th to 15th  
"Salute To Freedom"

### Superior Citrus and Avocado Trees

Best varieties on various root stocks. From heaviest bearing strains. Special Prices!

WARD'S NURSERY  
Avon Park - Florida

## Let The Groves Tell Their Story Of Fertilizer Effectiveness!

**THE  
SWIFT PLAN  
for CONTROLLED  
Tree  
Feeding**

Inspect any grove  
following the Swift  
Program...

The Outstanding condition of  
the Groves tell better than  
words of the results Red Steer  
Brands Give Their Users.

**Swift & Company  
Fertilizer Works**

Bartow, Florida

A Division Of Swift & Company



## Growers To Vote On Program For California-Arizona Grapefruit

The Surplus Marketing Administration of the Department of Agriculture has announced that a referendum will be held among growers on a proposed Federal marketing agreement program for the handling of winter grapefruit produced in Arizona, Imperial County, California, and in that section of Riverside County, California, situated south and east of San Geronio Pass.

Growers will vote on the issuance of a Federal order which would make the terms of the marketing agreement applicable to all handlers. At the same time, the marketing agreement will be submitted to handlers for their approval. The date of the referendum will be announced locally, at a later date.

Tentatively approved by the Secretary of Agriculture, the proposed marketing agreement program would regulate interstate shipments of desert grapefruit which is marketed largely during the winter months. If the proposed program for both states is approved by the industry and is made effective, it will operate in conjunction with a state program for California. The state program would include regulatory measures for the handling of California desert grapefruit marketed within that state. The industry has proposed no state program for Arizona, since most of the grapefruit produced in that state is consumed in other states.

As tentatively approved, the proposed Federal marketing agreement program would provide for: Regulation of interstate shipments of grapefruit by grades and sizes; reports from handlers on the grades and sizes of grapefruit contained in each shipment; the proration among handlers of program administrative expenses; and for an administrative committee of eight grower members and their alternates, of which four would represent California growers and four would represent Arizona growers. Similar regulatory provisions are contained in the proposed state marketing agreement program for California.

The Surplus Marketing Administration of the Department of Agriculture also announced that a referendum will be held among growers on a proposed Federal marketing agreement program for lemons produced in California and Arizona. The pro-

posed program would regulate the handling of lemons shipped in interstate commerce and to Canada from these two states, which comprise the major commercial lemon producing areas of the United States.

In the referendum, the date of which will be announced soon by designated agents of Secretary of Agriculture Claude R. Wickard, growers will vote on the issuance of a Federal order which would make the terms of the marketing agreement applicable to all handlers. At the same time, the marketing agreement will be submitted to handlers for their approval.

The proposed program as tentatively approved by Secretary Wickard provides for a Lemon Administrative Committee composed of six members and their alternates to administer the program. The proposed agreement would permit the regulation of the volume of shipments of lemons during weekly periods. Prorate bases would be established according to the quantity of lemons each handler has available for current shipment. Flexibility of operation is made possible under the proposed program through provisions for overshipments, undershipments, allotment loans, transfers, and assignments. Administrative expenses would be prorated among handlers. The proposed agreement would continue in effect until terminated, and its regulatory measures would not apply to lemons grown in California and Arizona and shipped within those states, to those shipped for charitable purposes, or to those used for manufacturing.

As tentatively approved, the proposed program can be made effective by the Secretary if issuance of the order is approved by at least 75 per cent of the growers who vote in the referendum by number and if the agreement is signed by handlers of at least 80 per cent of the volume of lemons handled.

No other nation has so well defended its farmers against the economic blows of the present world war. When we look at the desperate position of the export producers in other lands we certainly appreciate the advantages enjoyed by American export producers. — Claude R. Wickard.

## Stress Value Of Citrus Fruits in Treatment of Influenza

The value of Florida citrus fruits in avoiding and treating influenza, grippe and common colds, now prevalent in several sections of the nation, is being stressed in a series of newspaper advertisements and radio announcements released by the Florida Citrus Commission.

Sticking to those facts which have been determined in scientific and medical research, the campaign is citing the fact that the alkalizing effect of citrus fruits is highly beneficial in the prevention and treatment of these ailments.

While the series of ads and script for radio announcements have been prepared for some time, it was not until recently that the commission felt it was justified in placing the copy which is headed "How to Fight the Flu."

The newspaper ads, in 500 and 100 line sizes, are being placed in those areas where press associations quote authorities on the number of cases of flu reported from day to day. There is no attempt in the ads to throw fear into the public, and the copy urges the reader or listener to take no chances, but, instead of trying self-medication, to call a doctor upon the first sign of a respiratory ailment.

Scientists have known for some time that proper intakes of citrus fruits supply vitamins and other requisites for proper health and to build up resistance and stamina which help to ward off the attacks of common colds and such ailments.

Mary Margaret McBride, prominent columnist of the air, conducting a daily program for the Commission on a 38-station network of CBS, is urging her listeners to use more citrus and citrus juices to help ward off the colds.

The newspaper and radio advertising of citrus as an important aid in avoiding and fighting colds will continue as long as the situation warrants, the commission said, pointing out that while no cure for the common cold has ever been discovered, the use of citrus in such cases has generally proved very beneficial.

Twenty eastern Hillsborough county home demonstration club women recently obtained 128 rose bushes by cooperative purchase, according to Miss Irene Riley, home agent.

## FACTS ABOUT SPIDERS

(Continued from page 4)

it into the burrow. One of these Tarantulas is frequently shipped into this country on bunches of bananas. The danger from the bite of these so-called Tarantulas has been grossly exaggerated. Those that have been bitten by them say that the bite is not much worse than the prick of a large needle.

An interesting spider of this group occasionally met in Florida is the Purse-web spider. This spider like the Trap-door spider has a burrow in the ground and from the entrance she builds up the side of a tree a long narrow tubular web which is often more than a foot long. This so-called "purse" is fastened only at the top and bottom so that if any luckless insect touches it, it will cause the web to vibrate, whereupon the spider rushes up the tube and bites the insect through the silk wall. As is common with all spiders the bite soon paralyzes the insect. She then cuts the silk wall of the purse, drags the insect inside, proceeds to suck its body fluids, and then discards the carcass and repairs the slit in the wall of her home.

This group of spiders is characterized by having but two lungs whereas the other spiders including the one which probably frightened Miss Muffet have four lungs.

One of our oddest looking spiders and one often sent in for identification is the "Crab" spider. It is about a third of an inch long and gets its name from the fact that its body is hard, heavily chitinized and provided with six sharp points which give it the appearance of the crab;

hence the name. One of these crab spiders is commonly seen in orange groves where it constructs a web which may often reach from one tree to another across the row. Needless to say this spider, is as is most of its tribe, a highly beneficial animal in that it catches large numbers of insects. True, they are not discriminating; they catch our friends and foes alike, but on the whole the beneficial are not harmed as much as the injurious ones for the majority of the insects that parasitize other insects are too small to interest a spider.

By no means do all spiders construct webs. Some crawl about actively hunting for their prey which they jump upon and devour. These are called Wolf spiders. These are long legged swiftly moving animals as is necessary in a predator. They are provided with many eyes; the common ones having four pairs, eight eyes altogether, some of which are on top of their head where they can see anything behind them just as naughty boys and girls suspect their school teachers of having. It may well have been one of these Wolf spiders that frightened Miss Muffet. One extremely useful Wolf spider is commonly seen in houses running over the walls. It is a dark brown spider and including its legs is as large as a saucer. It feeds eagerly on cockroaches, flies, mosquitoes, etc. It is one of the most beneficial things to have in a house. Let it alone, ladies.

In conclusion, all of our spiders except the Black Widow are not only harmless, but beneficial and interesting animals. Don't be a Miss Muffet.

CITRUS COMMISSION MEMBERS  
WANT VALENCIA INSPECTION

At a meeting in Lakeland on January 14, the Florida Citrus Commission requested the state commissioner of agriculture to extend maturity inspection to include late oranges.

This extension was requested after several members declared that late variety Valencias usually escape the strict maturity checkup imposed on early fruit. Maturity inspection of shipments of fresh fruit is mandatory up to December 1 and may be extended to January 1 at the discretion of the commission, as was done this year on oranges.

Commissioner of Agriculture Mayo and Supervising Inspector George Copeland, who were present at the meeting, assured the commission that

a strict watch would be kept on the maturity of Valencia type oranges. Copeland said no Valencia pickings had as yet been reported.

## CLASSIFIED

## Advertisements

The rate for advertisements of this nature is only five cents per word for each insertion. You may count the number of words you have, multiply it by five, and you will have the cost of the advertisement for one insertion. Multiply this by the total number of insertions desired and you will have the total cost. This rate is so low that we cannot charge classified accounts, and would, therefore, appreciate a remittance with order. No advertisement accepted for less than 50 cents.

LAKE GARFIELD NURSERIES  
COMPANY  
BARTOW, FLORIDA

ALL STANDARD VARIETIES CITRUS TREES—SPECIAL PRICES  
NOW IN EFFECT

REWARD of five dollars to man showing me a SCUR ORANGE tree producing heavy crops RED fruits entirely free of scars and skin blemishes. Will pay additional for fruits and buds. Donald J. Nicholson, 1218 Greenwood, Orlando, Fla.

SUPERIOR CITRUS TREES of principal varieties. Also Persian limes and avocado trees and new varieties of tangelos. None injured by cold. Ward's Nursery, Avon Park, Florida.

ALYCE CLOVER SEED. Ripe and cleaned. Ideal cover and hay crop. Write for information. P. E. Snyder, Box 866, Lakeland, Fla.

CHOICE Rough Lemon Seedlings 6 to 20 inches high, \$10.00 per thousand. Olan Altman, Sebring, Florida.

LARGE AND SMALL orange groves for sale also acreage suited for citrus culture, dairying and general farming. Charlton & Associates, Valuation Engineers and Real Estate Appraisers, Ft. Lauderdale, Fla.

PLANT SOAR'S SWEET ORANGE trees for profit, fruit sells in September for \$1.12½ to \$1.50 per box. No losses from drops or frozen fruit, does not dry out on lemon. Pomona Nurseries, Dade City, Fla.

FOR SALE—Casurina Lophidophloia Florida's best windbreak trees \$5.00 per 100 — \$45.00 per 1000. S. F. Matthews, Homestead, Fla.

DR. DOLOMITE  
Diagnoses  
POOR CROPS

Doctor Dolomite has been scouting around again, looking out for your profit welfare.

And he's found that if you have trees with a hardened bark and stunted condition your soil needs calcium and magnesium . . . and needs it bad!

There's a simple way out . . . just add D-P DOLOMITE to your soil . . . and you'll get calcium carbonate plus magnesium carbonate, both essential plant foods.

Don't starve your trees and your profits . . . add D-P DOLOMITE. Through your regular fertilizer dealer or direct from us.

Write for free booklet:

**DOLOMITE**  
*Products, Inc.*  
DEPARTMENT 33  
OCALA, FLORIDA

## New Markets For Florida Citrus Possible

A vast new market for Florida citrus fruits — an area containing more than 20,000,000 people — may be opened in time for the 1941-42 marketing season if congress enacts legislation giving the interstate commerce commission jurisdiction over minimum truck weights and sizes.

The commission has completed an exhaustive study of truck restrictions under existing state laws and its report will be made to congress in the near future. One of the studies made by commission lawyers stated congress had the constitutional power to enact such a law, after tracing a legal history of pertinent precedents.

The Florida citrus commission, through its Washington office, is watching developments closely and has filed a brief urging the interstate commerce commission to recommend to congress that regulatory measures be passed.

The new market which would be opened includes Kentucky, Illinois, Ohio and Indiana. This area, for all practical purposes, is now barred from truck shipments of citrus from Florida because of Kentucky's 18,000 pound maximum limit on trucks passing through that state. A minimum of approximately 35,000 pounds is needed for economical hauling of citrus by trucks.

In its report, the citrus commission pointed to the disparity in truck shipments to the area north of the Kentucky-Tennessee state line compared with those reaching Virginia, Maryland and the District of Columbia. This latter area has a population of less than 5,000,000, the citrus board pointed out, but during the 1939-40 shipping season received 1,358,800 boxes of Florida citrus by truck. With more than 20,000,000 people, the area north of Kentucky and Tennessee received only 245,600 boxes during the same season, it was emphasized.

Some revision of Tennessee's truck law also would be helpful, the board said, as that state's maximum is only 24,000 pounds.

The average weight of the truck combination used in hauling citrus is 12,000 pounds unloaded, the citrus commission advised the commerce board, which restricted the payload to 66 boxes of fruit. Such vehicles could haul up to 300 boxes, however. It is not economically

practical to haul such small amounts, nor is it practical to "break the load" at the state line and make two or three trips, resuming with a full load beyond Kentucky's northern border.

The citrus commission attempted to have more favorable maximum weights established by the Kentucky legislature at its last session. It is also believed the citrus board would

be in an excellent bargaining spot with railroads for reduced rates if the truck situation were cleared up.

Senator Charles O. Andrews and other members of the Florida congressional delegation have indicated they will assist in any legislative process to correct the situation. It is considered likely the interstate commerce commission's report will be referred to the interstate commerce committee of the senate when received. Senator Andrews is a member of this committee. It would also be referred to the interstate and foreign committee of the house.

(Continued on page 22)

Double Value With . . .

# BROGDEX

REDUCES DECAY  
RETARDS SHRINKAGE

The Brogdex Process not only provides a

**Better Wilt Control**

but it also makes possible a

**Better Polish**

one that has longer life

\* \*

Some other wax processes may give you one and some the other, but . . .

# BROGDEX

GIVES YOU BOTH

**B. C. SKINNER, Distributor**

THE BROGDEX SYSTEM

Coloring Room Process

Color Added Process

DUNEDIN, FLORIDA



## No Cuts In Appropriations For Citrus Research Laboratories

There will be no cuts in the appropriations available for citrus research either at the Orlando laboratory or the Winter Haven laboratory, if congress enacts into law the recommendations made by the president in his annual budget.

This was made known recently by the Washington office of the Florida Citrus Commission, following close study of the new budget by Representatives Joe Hendricks and J. Hardin Peterson. The Orlando laboratory is in Mr. Hendrick's district, while the Winter Haven laboratory is in Mr. Peterson's district.

An apparent reduction in funds for the Winter Haven laboratory was explained by transfer of certain investigations to one of the now regional laboratories being constructed by the department of agriculture. This work involves research in the field of quick freezing, and the department has assured Mr. Peterson that this does not affect the amount of money available for expenditure in Winter Haven.

The amount shown in the budget for the Winter Haven laboratory for the fiscal year starting July 1 this year is \$126,980, compared with \$143,922 for the current fiscal year. The bureau of agricultural chemistry and engineering, which has jurisdiction over the Winter Haven laboratory, has assured Mr. Peterson, however, that their plans "call for the same expenditures in Winter Haven for the coming fiscal year as have been available during the present year."

For the Orlando laboratory, the new budget contains the figure of \$67,883, exactly the same as the appropriation for the current fiscal period. Rep. Hendricks and the citrus commission have been watching this item closely.

Most of the work at the Winter Haven laboratory is in the field of developing citrus by-products. The Orlando laboratory conducts transportation studies, coloring room research and much other valuable experimentation. The citrus commission in past years has augmented available funds for the Orlando laboratory in connection with work which it considered important and which could not be done with available federal funds. The bureau of plant industry has jurisdiction over

the Orlando laboratory.

While it is impossible to predict flatly that congress will make the full budget amounts available, both congressmen said that the inclusion of the figures in the budget overcame the first big hurdle. In view of the national defense requirements, they emphasized that it would have been very difficult to have any figure in the budget increased by the appropriations committee or on the floor of the house.

The representatives said they would follow the items closely as they went through the congressional mill here, making personal appearances before the agricultural appropriations subcommittee if necessary to have them retained. They did not expect any reduction to be made, however, barring some extreme emergency which might bring a blanket reduction in all non-defense appropriations.

Gratification was expressed by Representative Hendricks and Pet-

erson at the budget bureau's action in providing the same amount of money for the laboratories. Each had urged the department of agriculture and the bureau of the budget to provide additional funds for work which they considered important, but in view of the defense situation, both expressed satisfaction that no cut had been made, even though they were not able to get the requested additional money.

### CITRUS CONDITION GOOD

Lake County's citrus groves are in excellent condition and bloom buds are appearing on midseason and late fruit, reports County Agent R. E. Norris. Prospects are for a generally heavy bloom. Scale-insects have been a problem, and infestations remain heavy.

### Superior Citrus and Avocado Trees

Best varieties on various root stocks. From heaviest bearing strains. Special Prices!

WARD'S NURSERY  
Avon Park - Florida



REG. IN FLA.

**"The Modern Copper Fungicide"**  
is your best bet because:

1. It gives maximum efficiency at low cost.
2. It does not cause abnormal scale infestations.
3. It fits into normal spray combinations.
4. It is easy to handle and disperses readily in the spray tank.

COPOFILM is naturally fine. (It is not a ground product.) Its 1200 per inch particle size and its 34% metallic copper content are properly balanced to each other. This makes the material go farther and give better scab and melanose control . . . . The Florida citrus industry has recognized COPOFILM as the one outstanding copper fungicide.

## JACKSON GRAIN COMPANY

Tampa Florida

For Valuable Premiums Save the Coupons Packed in Copofilm